



February 23, 2022

David Fogt, Registrar of Contractors  
Contractors State License Board  
David.Fogt@cslb.ca.gov

Dear Registrar Fogt,

CALSSA appreciates that the Contractors State License Board is working to develop a reasonable alternative to the devastating and unjustified proposal to entirely prohibit solar contractors from installing Battery Energy Storage Systems with their qualified workforce—work that they have been safely performing under the C-46 license classification for over 40 years.

It was unfortunate that when you invited CALSSA, IBEW, and NECA to discuss staff's proposed alternative regulation, IBEW and NECA responded by submitting a 25-page letter written by their attorneys. That is not a very productive beginning to assist CSLB in developing a regulation that could be supported by all parties, as the Board requested. Nevertheless, we agree with IBEW on several points and remain hopeful that if the parties focus on a common-sense regulation, we can come to agreement on proposed language.

Given that the IBEW has rejected staff's proposed alternative, this letter focuses on responding to IBEW's proposal. We have had numerous conversations with solar representatives and other stakeholders over the past few weeks to discuss IBEW's proposed rule and how to build upon it. CALSSA's proposed rule, building on the IBEW proposal, is included in Attachment 1 to this letter. CALSSA would welcome a meeting with representatives of the stakeholders and CSLB to help move discussions along in a productive and expedited manner.

CALSSA agrees with IBEW that building occupancies should not be the basis for a regulatory limit, and that the definition of BESS should be modified.

We agree with IBEW that the CSLB should not base a regulatory threshold for BESS on a building's occupancy. The occupancy and building thresholds proposed by staff would create confusion, for instance in mixed-use buildings, and would prohibit much of the residential and commercial work that solar contractors commonly perform without a basis for making these distinctions. We also agree with IBEW that a regulatory threshold, if any, should be based on the size of the BESS.

To be clear, we stand firm behind the long track record of safe battery installations performed by C-46 solar contractors. We have noted a number of times that C-46 contractors have been installing BESS safely for decades and that neither CSLB nor the U.C. Berkeley Labor Center

were able to identify a single incident involving BESS that could have been prevented by regulating the customer-side installations performed by solar contractors in California. The

BESS reports also fail to recognize that existing laws extensively regulate the batteries that solar contractors install, as well as installation procedures, and that these regulations have been working well to protect workers and the public. Our November 24, 2021 letter to CSLB discusses these protections and the deficiencies in the Labor Center report in detail. I am also attaching a November 30, 2021 letter from the Chair of the California Energy Commission stating that “C-46 solar contracts have consistently delivered safe installations” and discussing the stringent safety standards for batteries. See Attachment 2.

Nonetheless, CALSSA would not oppose reasonable and practical limits on C-46 contractors with respect to the size of the battery. We recognize that utility and utility-scale battery installations pose unique challenges and may require installations by a separate contractor class. Accordingly, in November of last year, CALSSA proposed to the Board an alternative that would have prohibited C-46 solar contractors from installing BESS unless the system had an energy capacity of less than 1 megawatt-hour (1,000 kWh), the common threshold for utility and utility-scale systems. The incidents identified by the Labor Center report could support such an approach. In an effort to reach agreement, however, we consider and propose other alternatives as discussed below.

CALSSA also agrees with IBEW that staff’s proposed definition of BESS should be modified. We do not object to referring to “associated components” instead of “associated electrical equipment.” However, contrary to IBEW’s claims, many associated components do include electrical wiring and equipment. Of course, the solar panels and equipment associated with the panels are still a part of the solar energy system independent of the battery. We added language to the end of paragraph (c) to clarify this. We also deleted reference to BESS providing power to “a building,” as solar and storage projects may power other structures as well, such as well pumps, pool pumps, EV chargers, and air conditioners mounted outside a building. We similarly deleted the incomplete list of uses for the electrical power. Finally, we replaced “dispatch” electrical power with “discharge” electrical power because sometimes the power is dispatched external to the battery. We agree with IBEW’s other edits to the BESS definition.

IBEW’s proposed thresholds are not justified.

IBEW proposes prohibiting solar contractors from installing battery systems 50 to 100 times smaller than that the reasonable utility-scale threshold previously proposed by CALSSA. Under the IBEW’s proposal, solar contractors would be prohibited from installing any single battery with a power capacity (maximum output) of 20 kW or greater. They would also be prohibited from installing any system with a single or aggregate storage capacity of 20 kWh (for lithium and flow batteries). IBEW alternatively suggests a 10 kWh aggregate threshold for any battery type.

CALSSA cannot agree with these dramatic restrictions. To begin with, they are not justified. IBEW again raises hypothetical risks that fail to recognize existing product and regulatory

protections, installer trainings, and the proven effectiveness of those protections, as well as the extensive and safe track record in jobs performed by solar contractors.

Further, IBEW does not reference a regulatory or other basis for its proposed 20 kW power capacity threshold. The threshold is arbitrary and should thus be dismissed out of hand.

IBEW bases its battery storage capacity limit on California Fire Code Table 1206.1, which sets energy storage capacity thresholds above which minimum Fire Code requirements apply. (Note that the California Building Standards Commission issued a July 1, 2021 supplement to the 2019 Fire Code that completely replaced section 1206 regarding energy storage systems. Most of IBEW’s code references are thus out of date, including its reference to Table 1206.2, which is now Table 1206.1). These kWh thresholds are likewise unjustified.

Certified electrician training is not required to comply with the minimum standards in the Fire Code. For instance, these standards require contractors to submit construction documents and plans for commissioning, provide operations manuals to the owners, and follow requirements for signage, clearance, fire-resistant separations, and security.

Moreover, the requirements that the IBEW highlight demonstrate that these regulations already protect against the very risks they claim need to be addressed. For instance, the Code’s “thermal runaway” requirement provides that “batteries and other ESS shall be provided with a listed device or other approved method to prevent, detect and minimize the impact of thermal runaway.” CFC § 1206.6.5. In other words, this is a standard that the product to be installed must meet, not a standard on how the installation is performed.

If the CSLB wishes to tie battery capacity limits to the California Fire Code, the more appropriate table would be Table 1206.5, which sets maximum allowable quantities (meaning storage capacities) above which stricter fire-safety standards apply. For instance, to exceed limits in Table 1206.5, a hazard mitigation analysis and large scale fire test must be provided. CFC § 1206.5.2. In other words, the experts drafting the Fire Code felt comfortable that installations of BESS at or below the limits in Table 1206.5 do not require an extensive safety analysis. The limit for lithium-ion and flow batteries under Table 1206.5 is 600 kWh as shown below.

**TABLE 1206.5  
Maximum Allowable Quantities of Electrochemical ESS**

<b>Technology</b>	<b>Maximum Allowable Quantities</b>
<b>Storage Batteries</b>	
Lead-acid, all types	Unlimited
Nickel-cadmium (Ni-Cd)	Unlimited
Nickel-metal hydride (Ni-MH)	Unlimited
Lithium-ion	600 kWh
Flow batteries	600 kWh
Other battery technologies	200 kWh

CALSSA's attached proposed rule deletes reference to the baseless 20 kWh power capacity limit and replaces the reference to the outdated minimum threshold in Table 1206.2 with the 600 kWh limit in Table 1206.5. Note that the battery technologies with unlimited thresholds in Table 1206.5 are older technologies. The vast majority of battery installations today and in the foreseeable future will be lithium-ion batteries and flow batteries. Accordingly, it is reasonable to apply the 600 kWh limit to all battery technologies.

IBEW's proposed thresholds would severely limit solar and storage installations commonly performed by solar contractors and their qualified workers—at a time when the need for solar and storage projects is spiking.

In addition to lacking a justification, IBEW's 20 kW/20 kWh thresholds would have severe economic consequences for many solar contractors and their qualified workers. For example, commercial solar and storage projects are often 600 kWh or less. Similarly, a single Tesla Powerpack for small businesses and off-grid homes has a 232 kWh capacity. These batteries are often strung together and are typical for solar contractors who do not exclusively work in the residential space but rather offer their services to homes and businesses in their region. This is most common in rural areas and for small businesses.

For solar contractors who do specialize in residential projects, the IBEW proposal would restrict a significant portion of that work. For example, a Tesla Powerwall has 13.5 kWh capacity, and many homes require at least two Powerwalls, if not more, particularly for whole home backup.

IBEW's proposed limits would particularly harm small-businesses and workers from disadvantaged communities. For example, our November 2021 letter to the Board included a declaration from Jeanine Cotter, co-founder and CEO of Luminalt, a majority women-owned construction company dedicated to a diverse workforce. In 2008, Luminalt was San Francisco's first GoSolarSF workforce development certified company. Since then, Luminalt has hired and trained individuals with barriers to employment to work exclusively on solar and solar paired storage projects. Luminalt is a Tesla Powerwall certified installer and a significant portion of its installations involve two or more Powerwalls. IBEW's proposed threshold would therefore severely limit Luminalt's work, as only one of its 51 employees is a certified electrician. This also means that the company is limited to one electrical trainee under 1:1 supervision requirements. If the IBEW's proposed rule were adopted, it would prohibit Luminalt from being able to use its trained diverse workforce on precisely the type of projects it has successfully been building as a core part of its business.

The impact to Luminalt is not unique. Our November 2021 letter also included a declaration from Luke Miller, owner of SolarHut, LLC, a family-owned company with four installer employees. On average in the last two years, over a third of SolarHut's solar and storage projects exceeded 20 kWh. And over the last six months, the company has installed a significantly higher amount of projects with batteries.

Contrary to IBEW’s claims, its proposed rule would dramatically restrict the contractors available to install solar and storage projects increasingly demanded by Californians. IBEW relies on the Self Generation Incentive Program (SGIP) database to argue that 80 percent of residential BESS projects have a storage capacity under 20 kWh. But even based on this data, that means that solar contractors would have been prohibited from installing 2,787 residential solar and storage projects between 2017 and August 2019. And those are only the projects that received a rebate. Many did not.

Not only has residential demand for solar and storage continued to grow since 2019, the SGIP database captures only those projects that received an incentive under the program, which is limited. The more complete database to review is the interconnection database, which captures roughly 80 percent of the grid-tied solar and storage projects in California.

CALSSA reviewed interconnection data for solar and storage projects completed between January 2020 and August 2021. As shown in the below table, we found that under IBEW’s proposed 20 kWh limit, solar contractors would have been precluded from installing 13,388 residential projects—representing over *one third* of all residential projects. And they would have been precluded from installing *over 70 percent* of commercial projects.

<b>Energy Storage System Capacity (kWh)</b>				
<b>Project Type/Size</b>	<b>2020 tally</b>	<b>2021 tally</b>	<b>2020 + 2021</b>	<b>% of market</b>
<b>Residential</b>				
# ≤ 20 kWh	11,181	12,219	23,400	63.6%
# ≤ 20 kWh	5,557	7,831	13,388	36.4%
Total	16,738	20,050	36,788	100%
<b>Commercial</b>				
# ≤ 20 kWh	28	94	122	28.4%
# ≤ 20 kWh	183	125	308	71.6%
Total	211	219	430	100%

Given these restrictions, IBEW’s proposal would severely hamper implementation of State programs that aim to dramatically increase the deployment of battery storage in California. For example, the California Energy Commission’s updated Building Energy Efficiency Standards require solar panels and battery storage on new commercial buildings beginning in 2023. The BESS required for this construction would often exceed the limits proposed by the IBEW.

Thus, solar contractors, who currently perform over 80 percent of battery installations, would need to obtain a C-10 classification if they don’t already have one *and* find certified electricians to supplement or replace their existing qualified solar workers. Even if solar contractors could subcontract with C-10 contractors, this still does not address the critical shortage of certified electricians to perform the work.

Further, solar contractors and their qualified workforce have extensive experience and safety and installation trainings specific to battery storage for solar projects. As the California Energy

Commission’s letter urges, “Delivery of battery systems in compliance with the CEC’s Building Energy Efficiency Standards will be dependent on well-trained and skilled contractors with *demonstrated experience* in installing these combined systems.”

IBEW claims that its proposal would only impact contractors who have a C-46 license with no other classification and that those contractors install less than 3 percent of all solar and storage projects. IBEW’s perspective is from a fantasy world. As CALSSA explained in our November 24, 2021 letter to the Board, while many C-46 solar contractors also have a C-10 electrical classification, they install the vast majority of solar and storage projects under their C-46 license. One only need pull the building permits to confirm this. As a result, any restriction on battery installations would actually impact C-46 contractors who currently perform over *80 percent* of solar and storage projects (contractors holding a C-46 license plus those that hold a C-46 and C-10 classification, based on the Labor Center’s evaluation of the Interconnection Dataset).

Rulemaking must clarify that solar contractors may install qualifying batteries to existing photovoltaic (PV) solar panels and maintain the batteries they have already installed.

Under a CSLB misinterpretation of current regulations, solar contractors are prohibited from adding a battery to existing PV solar panels. There is no justification for allowing the installation of batteries at the same time as the solar panels, but prohibiting that same battery installation if it occurs later in time under a separate contract. CSLB’s misinterpretation is simply based on semantics and there is a chance to correct this pointless anomaly during the current rulemaking.

Doing so will also remove the catch 22 that many solar customers wishing to add a storage component to their solar energy systems now face: if they want to maintain the warranty on their solar panels, they must hire the same contractor to install and connect the batteries, but they cannot hire that contractor because CSLB’s misinterpretation prevents the contractor from doing the work.

By expressly stating that allowed BESS are one component of a solar energy system (which has always been the case), solar contractors could again add storage batteries to existing solar panels that they previously installed. This would allow customers to maintain the warranty on those systems. It would also remove a current roadblock to help address the state’s shortage of energy storage capacity, a shortage that led the Governor to proclaim a state of emergency in 2021.

CALSSA’s modification to IBEW’s proposed rule thus clarifies that installing and maintaining BESS below the size limits in the C-46 classification is a part of the authorized work for solar contractors, and not simply incidental and supplemental to it. This should be obvious as staff’s and IBEW’s proposed regulations amend the classification to *expressly* allow for the installation of qualify BESS. (They similarly amend the C-10 classification to expressly allow for the installation of BESS). Given statements in IBEW’s letter, however, we felt the regulation deserved further clarification to avoid any disputes down the road about the ability of solar contractors to connect allowed batteries to existing solar panels.

We also added a grandfather clause to allow solar contractors to maintain or repair any BESS that the contractor installed prior to the new regulations. This would allow contractors to fulfill their contractual obligations and allow the customers to maintain the warranty on those systems.

We look forward to discussing these modifications with other stakeholders and CSLB.

Sincerely,

A handwritten signature in black ink, appearing to read "B. Del Chiaro". The signature is fluid and cursive.

Bernadette Del Chiaro, Executive Director  
California Solar and Storage Association

ATTACHED:

Modified language redlined

Modified language clean version

November 30, 2021 letter from the Chair of the California Energy Commission

## EXHIBIT A

### **CALSSA MODIFICATIONS TO** **IBEW NECA LMCC ALTERNATE PROPOSED C-46 CONTRACTOR** **CLASSIFICATION AMENDMENT RE BATTERY ENERGY STORAGE** **(REDLINE TO IBEW NECA LMCC ALTERNATIVE TO CSLB PROPOSAL)**

#### **§ 810. Definitions**

(a) For purposes of this division, “battery energy storage system” means a rechargeable energy storage system consisting of electrochemical storage batteries, battery chargers, controls, and associated components designed to absorb, store and ~~dispatch~~ **discharge** electrical power ~~to a building for the purpose of providing standby or emergency power, an uninterruptable power supply, load shedding, load sharing or similar capabilities to a building.~~

(b) For the purposes of this ~~chapter~~ division, “Board” means the Contractors State License Board and “Code,” unless otherwise defined, means the Business and Professions Code.

Note: Authority cited: Section 7008, Business and Professions Code. Reference: Section 7008, Business and Professions Code.

#### **§ 832.10, Class C-10 - Electrical Contractor**

An electrical contractor places, installs, erects or connects any electrical wires, fixtures, appliances, apparatus, raceways, conduits, battery energy storage systems, solar photovoltaic cells or any part thereof, which generate, transmit, transform or utilize electrical energy in any form or for any purpose.

Note: Authority cited: Sections 7008 and 7059, Business and Professions Code. Reference: Sections 7058 and 7059, Business and Professions Code.

#### **§ 832.46. Class C-46 - Solar Contractor**

(a) A solar contractor installs, modifies, maintains, and repairs thermal and photovoltaic solar energy systems.

(b) A licensee classified in this section shall not undertake or perform building or construction trades, crafts, or skills, except when required to install a thermal or photovoltaic solar energy system.

(c) For the purposes of this section, a battery energy storage system, as defined in section 810, shall ~~not be considered part of, required in, or incidental and supplemental to the installation of,~~ a photovoltaic solar energy system ~~unless if it has a power capacity below 20kW and a storage capacity at or below the storage system threshold quantity set forth in Table 1206.2 of the 2019 California Fire Code 600 kWh.~~ A battery



energy storage system that meets or exceeds either of these thresholds shall be considered a separate system and shall not be considered incidental and supplemental to the installation of a photovoltaic solar energy system. A solar contractor may subcontract installation of a battery energystorage system of any size with an appropriately licensed contractor. When subcontracting for the installation of a battery energy storage system of any size, a solar contractor may install all components of a photovoltaic solar energy system up to the device that stores the electrical power. Nothing in this paragraph is intended to prohibit a solar contractor from installing solar energy system components other than the battery energy storage system.

(d) A solar contractor may modify an existing solar energy system by adding a battery energy storage system that meets the requirements of paragraph (c). A solar contractor may maintain or repair a battery energy storage system of any size that the solar contractor installed prior to the effective date of this amended section.

Note: Authority cited: Sections 7008 and 7059, Business and Professions Code.  
Reference: Sections 7058 and 7059, Business and Professions Code.

### **§ 831. Incidental and Supplemental Defined.**

(a) For purposes of Section 7059, work in other classifications is “incidental and supplemental” to the work for which a specialty contractor is licensed if that work is essential to accomplish the work in which the contractor is classified. A specialty contractor may use subcontractors to complete the incidental and supplemental work, or he may use his own employees to do so.

(b) For purposes of Section 7059 of the Code and this division, installation, connection, modification, maintenance, or repair of a battery energy storage system, as defined in section 810, is not “incidental and supplemental” to the work performed by a licensee classified as a C-46 Solar Contractor pursuant to section 832.46, provided that installation, connection, modification, maintenance, and repair of a battery energy storage system; except is work for which a Solar Contractor is licensed in the circumstances described in paragraph (c) of section 832.46 as approved by the Board on [date].

(c) Notwithstanding any provision of this Section or Division, a solar contractor may subcontract installation of a battery energy storage system of any size with an appropriately licensed contractor.

Note: Authority cited: Sections 7008 and 7059, Business and Professions Code.  
Reference: Sections 7058 and 7059, Business and Professions Code.

## EXHIBIT B

### CALSSA MODIFICATIONS TO IBEW NECA LMCC ALTERNATE PROPOSED C-46 CONTRACTOR CLASSIFICATION AMENDMENT RE BATTERY ENERGY STORAGE

#### § 810. Definitions

(c) For purposes of this division, “battery energy storage system” means a rechargeable energy storage system consisting of electrochemical storage batteries, battery chargers, controls, and associated components designed to absorb, store and discharge electrical power.

(d) For the purposes of this ~~chapter~~ division, “Board” means the Contractors State License Board and “Code,” unless otherwise defined, means the Business and Professions Code.

Note: Authority cited: Section 7008, Business and Professions Code. Reference: Section 7008, Business and Professions Code.

#### § 832.10, Class C-10 - Electrical Contractor

An electrical contractor places, installs, erects or connects any electrical wires, fixtures, appliances, apparatus, raceways, conduits, battery energy storage systems, solar photovoltaic cells or any part thereof, which generate, transmit, transform or utilize electrical energy in any form or for any purpose.

Note: Authority cited: Sections 7008 and 7059, Business and Professions Code. Reference: Sections 7058 and 7059, Business and Professions Code.

#### § 832.46. Class C-46 - Solar Contractor

(c) A solar contractor installs, modifies, maintains, and repairs thermal and photovoltaic solar energy systems.

(d) A licensee classified in this section shall not undertake or perform building or construction trades, crafts, or skills, except when required to install a thermal or photovoltaic solar energy system.

(c) For the purposes of this section, a battery energy storage system, as defined in section 810, shall be considered part of a photovoltaic solar energy system if it has a storage capacity at or below 600 kWh. A battery energy storage system that exceeds this threshold shall be considered a separate system and shall not be considered incidental and supplemental to the installation of a photovoltaic solar energy system. A

solar contractor may subcontract installation of a battery energystorage system of any size with an appropriately licensed contractor. When subcontracting for the installation of a battery energy storage system of any size, a solar contractor may install all components of a photovoltaic solar energy system up to the device that stores the electrical power. Nothing in this paragraph is intended to prohibit a solar contractor from installing solar energy system components other than the battery energy storage system.

(d) A solar contractor may modify an existing solar energy system by adding a battery energy storage system that meets the requirements of paragraph (c). A solar contractor may maintain or repair a battery energy storage system of any size that the solar contractor installed prior to the effective date of this amended section.

Note: Authority cited: Sections 7008 and 7059, Business and Professions Code.  
Reference: Sections 7058 and 7059, Business and Professions Code.

### **§ 831. Incidental and Supplemental Defined.**

(d) For purposes of Section 7059, work in other classifications is “incidental and supplemental” to the work for which a specialty contractor is licensed if that work is essential to accomplish the work in which the contractor is classified. A specialty contractor may use subcontractors to complete the incidental and supplemental work, or he may use his own employees to do so.

(e) For purposes of Section 7059 of the Code and this division, installation, connection, modification, maintenance, or repair of a battery energy storage system, as defined in section 810, is not “incidental and supplemental” to the work performed by a licensee classified as a C-46 Solar Contractor pursuant to section 832.46, provided that installation, connection, modification, maintenance, and repair of a battery energy storage system; is work for which a Solar Contractor is licensed in the circumstances described in paragraph (c) of section 832.46 as approved by the Board on [date].

(f) Notwithstanding any provision of this Section or Division, a solar contractor may subcontract installation of a battery energy storage system of any size with an appropriately licensed contractor.

Note: Authority cited: Sections 7008 and 7059, Business and Professions Code.  
Reference: Sections 7058 and 7059, Business and Professions Code.

## **EXHIBIT C**

**November 30, 2021 letter from the Chair of the California Energy Commission**



November 30, 2021

Susan Granzella, Chair  
Contractors State License Board

Re: November 29, 2021 Board Meeting Agenda Item D.1. Initiate Rulemaking Process to Amend CCR, Title 16 regarding C-10 Electrical Contractor and C-46 Solar Contractor

Dear Chair Granzella,

Thank you for the opportunity to provide relevant context for this item. As Governor Newsom has often said, we are in a climate emergency, creating a call to action for all state agencies. To meet our climate goals, rapid scale-up of renewable energy generation and battery storage is needed, from small residential systems to the largest utility scale installations.

On August 11, 2021, the California Energy Commission (CEC) adopted new Building Energy Efficiency Standards that dramatically decarbonize our buildings and reduce greenhouse gas (GHG) emissions. A major feature of those Standards was the requirement for the first time of photovoltaic (PV) systems coupled with battery storage for multi-family buildings and many nonresidential building types.

Delivery of battery systems in compliance with the CEC's Building Energy Efficiency Standards will be dependent on well-trained and skilled contractors with demonstrated experience in installing these combined systems. To the best of the CEC's knowledge, to date, both C-10 electrical contractors and C-46 solar contractors have consistently delivered safe installations. Indeed, training curricula for both licenses covers batteries and related topics. For example, the CSLB's 2017 Occupational Analysis Report for the C-46 Solar Examination shows that installation of battery storage is interwoven with the everyday duties of solar contractors.

The CEC supports battery safety by maintaining lists of equipment certified to meet required safety standards for both PV and battery systems. To qualify for compliance with the CEC's Building Energy Efficiency Standards and participate in utility programs, battery storage systems must meet these equipment safety standards. The CEC's eligible equipment lists are widely relied upon to identify equipment that have been certified to meet these safety standards. Additionally,

Susan Granzella  
November 30, 2021  
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the CEC's R&D investments are helping strengthen the safety of the next generation of batteries by reducing the degradation of components. For example, with CEC funding, Coreshell Technologies developed new safety-enhancing electrode coatings in lithium-ion batteries and Sepion Technologies is now developing more robust membranes for lithium batteries.

To meet the needs of a growing market for renewables generally and for storage specifically, California needs a well-trained, capable, and growing workforce. I appreciate all you do in support of that end.

Please let me know any questions you may have.

Thank you for your consideration,

A handwritten signature in black ink, appearing to read "David Hochschild". The signature is fluid and cursive, with a large initial "D" and "H".

David Hochschild  
Chair

cc: David Fogt, CSLB Registrar